View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by OpenCommons at University of Connecticut

University of Connecticut
OpenCommons@UConn

UCHC Articles - Research

University of Connecticut Health Center Research

11-2009

Individualized Assessment and Treatment Program for Alcohol Dependence: Results of an Initial Study to Train Coping Skills

Mark D. Litt
University of Connecticut School of Medicine and Dentistry

Ronald M. Kadden
University of Connecticut School of Medicine and Dentistry

Elise Kabela-Cormier
University of Connecticut School of Medicine and Dentistry

Follow this and additional works at: https://opencommons.uconn.edu/uchcres_articles

Part of the Medicine and Health Sciences Commons

Recommended Citation

Litt, Mark D.; Kadden, Ronald M.; and Kabela-Cormier, Elise, "Individualized Assessment and Treatment Program for Alcohol Dependence: Results of an Initial Study to Train Coping Skills" (2009). *UCHC Articles - Research*. 44.
https://opencommons.uconn.edu/uchcres_articles/44

NIH Public Access
Author Manuscript
Addiction. Author manuscript; available in PMC 2010 November 1.

Published in final edited form as:
Addiction. 2009 November ; 104(11): 1837–1838. doi:10.1111/j.1360-0443.2009.02693.x.

Individualized Assessment and Treatment Program for Alcohol Dependence: Results of an Initial Study to Train Coping Skills

Mark D. Litt
Department of Behavioral Sciences and Community Health, University of Connecticut Health Center

Ronald M. Kadden
Department of Psychiatry, University of Connecticut Health Center

Elise Kabela-Cormier
Department of Psychiatry, University of Connecticut Health Center

Abstract

Aims—Cognitive-behavioral treatments (CBT) are among the most popular interventions offered for alcohol and other substance use disorders, but it is not clear how they achieve their effects. CBT is purported to exert its beneficial effects by altering coping skills, but data supporting coping changes as the mechanism of action are mixed. The purpose of this pilot study was to test a treatment in which coping skills were trained in a highly individualized way, allowing us to determine if such training would result in an effective treatment.

Design—Participants were assigned randomly to a comprehensive packaged CBT program (PCBT), or to an Individualized Assessment and Treatment Program (IATP). The IATP program employed experience sampling via cellphone to assess coping skills prior to treatment, and provided therapists a detailed understanding of patients' coping strengths and deficits.

Setting—Outpatient treatment.

Participants—A total of 110 alcohol dependent men and women.

Measurements—Participants in both conditions completed experience sampling of situations, drinking and coping efforts prior to, and following, 12 weeks of treatment. Timeline follow-back procedures were also used to record drinking at baseline and posttreatment.

Findings—IATP yielded higher proportion days abstinent (PDA) at posttreatment ($p < .05$) than did PCBT, and equivalent heavy drinking days. IATP also elicited more momentary coping responses, and less drinking, in high risk situations, as recorded by experience sampling at posttreatment. Posttreatment coping response rates were associated with decreases in drinking.

Conclusions—The IATP approach was more successful than PCBT at training adaptive coping responses for use in situations presenting high-risk for drinking. The highly individualized IATP approach may prove to be an effective treatment strategy for alcohol dependent patients.

Keywords

Individualized treatment; CBT; experience sampling; coping skills

Correspondence concerning this article may be addressed to: Mark D. Litt, Ph.D., Department of Behavioral Sciences and Community Health, MC3910, University of Connecticut Health Center, Farmington, CT 06030. Electronic mail should be sent to Litt@nso.uchc.edu..

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Cognitive-behavioral treatments (CBT) are among the most popular treatments offered for alcohol and other substance misuse, but it is not clear how they achieve their effects. It has been assumed that the mechanism of action responsible for the success of CBT is the acquisition and performance of coping skills used to manage high-risk for drinking situations, and to enhance the person's confidence in his or her ability to stay sober.(1)

Although greater use of coping skills appears to be related to better outcomes in some studies, it is not clear that coping skills per se are responsible for those outcomes. To make a case for the role of coping in outcome, it would be necessary to show that a treatment designed to increase coping in fact did so, and that increased coping was associated with abstinence or reduction of drinking (2). Data of this sort are hard to come by; few studies actually document acquisition or use of coping skills, or examine whether skills acquisition is associated with treatment outcome. Studies that have evaluated the mechanisms of coping skills treatments have found that either: (a) CBT resulted in greater increases in coping than did a comparison treatment but increased coping was not related to outcome, or (b) coping skills were related to outcome but change in coping could not be attributed to CBT (3,4). A related development is the finding in several recent studies that CBT was not superior to robust alternative treatments that were not based on development of coping skills(5-7).

There are several possible explanations for the failure to find a mediational role for coping skills in studies of CBT for alcohol dependence. The first is that the measures used to assess coping skills may be inadequate. Generally speaking we have poor methods for measuring coping actions, particularly in actual high-risk situations (8). Another possibility is that coping skills training is not necessary to yield good treatment outcomes. It is possible that other variables, such as motivation or self-efficacy, may be responsible for treatment success, and that simply entering into any treatment may be sufficient to mobilize patients' coping efforts (4).

Finally, another explanation for the lack of superiority for CBT may be that the delivery of treatment is flawed. A potential problem with manualized cognitive-behavioral treatments like those used in research is that individual differences may be overlooked. A typical manual contains a fixed agenda of skills that are deemed necessary for all patients to have (e.g., identifying high-risk situations, managing cravings), on the assumption that a high level of standardization will improve treatment effectiveness and reduce the variance attributable to therapist skill. However, this approach has not always proven to be effective (9).

The purpose of this study was to devise and test a treatment in which coping skills could be assessed in near-real time and, on the basis of that assessment, a highly individualized treatment could be formulated for each patient that would address specific coping deficits and capitalize on existing coping resources. This Individualized Assessment and Treatment Program (IATP) was matched against a more conventional manualized (“packaged”) cognitive-behavioral program (PCBT). PCBT, based on the treatment manual used in Project MATCH(10), was chosen because it is widely used, and is a good example of current standardized coping skills treatments employed in the community and in research for both individuals and groups. Both PCBT and IATP were intended to teach coping skills, but in different ways.

Both treatments lasted 12 sessions. Assessments were conducted at intake and at posttreatment, approximately 16 weeks after intake. Initial assessment of coping resources was conducted using experience sampling (ES) methodology. Patients carried cell phones for two weeks prior to beginning treatment, and were called eight times per day to record their thoughts, feelings and behaviors, especially those associated with drinking. In the IATP

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

condition the ES records were abstracted and delivered to the patient's therapist, who used the records to develop an individualized treatment program. In the PCBT condition the records were collected but not used by the therapist. Experience sampling was repeated at posttreatment. This paper reports on the posttreatment drinking rates and coping skills. It was expected that IATP would elicit more use of coping skills, and better drinking outcomes at posttreatment, than would PCBT.

Methods

Participants

Recruitment occurred from December 2005 through October of 2007. Participants were recruited through newspaper and radio advertisements, and through other research programs at our university medical center. To be eligible individuals had to be at least 18 years old, meet DSM-IV criteria for alcohol abuse or dependence, and be willing to accept random assignment to either of the two treatment conditions. Individuals were excluded from participation if they had acute medical or psychiatric problems requiring inpatient treatment (e.g., acute psychosis, or suicide/homicide risk), current dependence on drugs (except nicotine and marijuana), recent intravenous drug use, reading ability below the fifth grade level, lack of reliable transportation to the treatment site, or excessive commuting distance. Individuals were also excluded if they were already engaged in substance abuse treatment elsewhere, or if they denied any drinking in the previous 60 days.

Of 164 men and women who responded to advertisements and were screened, 144 were eligible according to the criteria described. Most of those excluded had a history of or continuing drug addiction, or were deemed to have treatment needs greater than those that could be provided in this context. Of the 144 eligible, 34 dropped out of the study prior to randomization, primarily due to lack of interest. The remaining 110 participants were assigned to the two treatment conditions, PCBT (n=53) and IATP (n=57), and 93 provided data at posttreatment (45 in PCBT and 48 in IATP). A sample size of 50 per cell was determined to be sufficient to test most hypotheses with a power of .80 and alpha set at .05, based on effect sizes derived from previous studies of coping skills measures and outcomes (7).

Among the participants 58% were male, with a mean age of 48.8 years (*SD* = 12.3); 86% were White, 9% Black, 3% Hispanic, and 2% other. Their mean years of schooling was 13.9 (*SD* = 2.1), 56% were employed at least part time outside the home, and 51% were living with a spouse or partner. All met criteria for alcohol dependence (99%) or abuse (1%), drank on a mean of 70% of days in the 3 months prior to intake, and had a mean of 1.2 prior treatments for alcohol dependence (*SD* = 2.4). Univariate tests revealed no significant differences on any characteristic between the treatment conditions.

Measures and Instruments

Diagnostic interview—The Structured Clinical Interview for DSM-IV Axis I Disorders, Patient edition(SCID-I/P), version 2.0 (11), was used to determine whether subjects met inclusion/exclusion criteria for alcohol abuse or dependence, drug dependence, and psychotic symptoms in the 90 days prior to the interview. A locator form was completed asking the participant about availability of a spouse or close friend who would know the person's whereabouts if he/she moved without notice during the course of the study.

Drinking Outcome Variables—Drinking data were collected using the Form-90 (12), a calendar-based survey of daily drinking for the 90 days prior to intake. It was used again at

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

the posttreatment assessment. The Form-90 has good test-retest reliability, and validity for verifiable events (13).

Psychosocial Outcome—The Drinker Inventory of Consequences (DrInC)(14), was used to assess problems related to drinking at baseline and posttreatment. The DrInC Total score had an internal reliability alpha = .89.

Treatment process: Coping Strategies—The Coping Strategies Scale (CSS)(4) was administered at baseline and posttreatment to assess coping skills. Subjects rated the frequency (from 0 = never to 4 = frequently) of utilizing each of 59 strategies to resist drinking in the prior 3 months. The CSS total score was computed by averaging the ratings of the 59 items (range 0 - 4). The internal reliability of the CSS total score exceeded $\alpha = .96$ at both of the administrations.

Experience Sampling (ES) of situations and coping via Interactive Voice Response (IVR)—Experience Sampling in both treatment groups allowed us to assess use of coping skills while avoiding many of the problems inherent in retrospective recording. ES was conducted through the use of Interactive Voice Response (IVR) technology, in which assessments were made by calling participants on cellular telephones issued to participants upon entry into the study. A research assistant clarified for patients terms such as “urge to drink,” (i.e., ”intense desire or craving for alcohol”) and how much alcohol constituted a single drink. Patients practiced until they respond to the cell phone call and answer the questions without hesitation.

Participants were asked to carry the cellular telephone at all times in Weeks 1 and 2 (before treatment started), and again in Weeks 15 and 16 (at the end of the 12 sessions of treatment), for most patients. Although patients reported no significant difficulties with the experience sampling protocol at pretreatment, some patients did complain that the posttreatment protocol was burdensome. To reduce burden at posttreatment while still retaining a usable sampling of data, the posttreatment experience sampling protocol was changed for the last 47 patients, who were prompted only six times per day, and only for one week instead of two.

To promote protocol compliance at the end of the posttreatment follow-up period (weeks 15 and 16) subjects were paid $5.00 for every day of at least 75% of scheduled recordings completed, and received an extra $15.00 per week for at least 5 such recording days in that week. The possible total incentive was thus $50.00 per week.

The telephone-based Interactive Voice Response system used to place calls, administer assessment questions, and record responses was developed by Telesage (Chapel Hill, NC). The system was programmed to call subjects' cell phones on a quasi-random basis 8 times per day, with one randomly scheduled prompt in each of eight 105-minute time periods from 8:00AM to 10:00PM. This frequency of recording was chosen to enable us to capture as many moments in a patient's day as possible without being disruptive (15). Subjects had the option of delaying responding to a call for 5, 10 or 15 minutes when answering was inconvenient.

Recording format—Participants responded to recorded questions using the cell phone keypad. Responses were time-and-date-stamped, and entry of out-of-range data was not allowed. If data entry was abandoned in the midst of an assessment, the system called the participant back and resumed the assessment. Assessment data were electronically stored in spreadsheet format on the system server and backed up nightly. Data from each participant engaged in ES monitoring were examined each day for missing responses by a research

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

assistant. If a participant missed two calls in a row, the research assistant contacted the individual by phone. The compliance rates for experience sampling were as follows: at pretreatment (N=108) 70% of calls were completed (range: 2% to 99%; 17 cases responding below 40%); at posttreatment (N=77) 69% of calls were completed (range: 10% to 100%; 12 cases responding below 40%).

ES data—Data collected during ES included items related to urges to drink, situations, coping actions, and drinking since the last recording. For every recording the subject was prompted to record perceptions along a 5-point scale ranging from “0=Not at all” to “4=Very much.” The first question presented was “Urge to drink.” Our laboratory and field studies indicate that this urge rating item has a test-retest reliability of r = .90(15,16). Situational context was assessed by asking the person to specify where he or she was and what he/she was doing. The participant's voice response was recorded for coding later (e.g., “at work”, “in the car”, “at home,” etc.) by research assistants using a card-sort technique. Participants also indicated if the situation permitted drinking.

Mood state was recorded using 8 mood items derived from the circumplex model of mood experience (17). The items were combined to yield four reliable mood composites (alphas exceed .80): Positive-high activation (e.g., happy); positive-low activation (e.g., relaxed); negative-high activation (e.g., angry), and negative-low activation (e.g., bored).

Coping responses were assessed by first asking the subject if he or she had been thinking about drinking, had taken a drink, or been tempted to drink since the last recording. The person was then asked what if anything he or she had done to keep from drinking, and was presented with a list of potential coping responses. The patient was instructed to press “1” for each response he/she used in the face of the drinking stressor. (If the person had not been tempted, all responses were “0”). The coping response items were derived from inventories assessing coping in substance abuse treatment (e.g., the CSS), and from informal surveys of patients in alcohol treatment (15). Sample items include: “Prayed;” “Sought help;” “Called my sponsor;” “Waited until the urge went away;” “Distracted myself;” “Left the situation;” etc. Also included in this list was “Drank,” and “Nothing.” The final question asked how many drinks were consumed since the last call. The total phone interview required about 2.5 minutes to complete.

Prior to starting treatment, all of these responses were collated by a research assistant and provided to the therapists for use in the IATP condition in the form of a functional analysis (FA) chart. The FA Chart offered a maximum of 112 opportunities (8 entries per day × 14 days) to evaluate patient reactions to various situations. The ES protocol was repeated when treatment was finished.

Procedures

Initial evaluation and posttreatment data collection—Prospective subjects were evaluated through an initial telephone screening procedure. Those who were eligible for the research and agreed to be assigned randomly to treatment, reviewed and signed an IRB-approved consent form and completed the intake assessment, consisting of the measures described above. Participants were assigned to treatment using an urn randomization procedure (18) that balanced the two groups for gender, age, baseline readiness to change, self-efficacy and CSS Total score. Participants were reimbursed $40.00 for completion of the intake assessment. The posttreatment assessment was scheduled for the period after treatment was completed, and after the posttreatment experience sampling period. Participants were reimbursed $25.00 for completion of the posttreatment assessment.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Treatments

Two Master's level therapists with at least two years experience treating alcohol dependence provided both of the study treatments, to minimize therapist effects. Treatment was conducted in 12 weekly 60-minute outpatient sessions, employing detailed therapist manuals. The treatment was provided free of charge. Participants presenting to a treatment session with a breathalyzer reading above .05 were rescheduled. Overall, patients attended an average of 8.4 sessions (*SD*=4.5), with no differences between treatment conditions. Subjects were neither encouraged nor discouraged from attending Alcoholics Anonymous meetings. For both treatments, patient adherence to treatment assignments was monitored by the therapists.

Packaged Cognitive-Behavioral Therapy (PCBT)—PCBT in this study was based on cognitive-behavioral principles and designed to remediate deficits in skills for coping with interpersonal (e.g., social pressure, conflict with others) and intrapersonal (e.g., craving, anger) antecedents to drinking. The treatment, based on manuals developed for our previous clinical research and for Project MATCH (10,19), provided a structured experience using didactic presentations, behavioral rehearsal, and homework practice exercises. Homework was prescribed after every session, and was relevant to the material covered in that session.

IATP—The Individualized Assessment and Treatment Program employed a functional analysis of patients' behavior as assessed by the interactive voice response system during the 2-week pretreatment experience-sampling period. The situations that each patient encountered during ES monitoring were reconstructed from the monitoring data, along with accompanying mood states, cognitive appraisals and coping actions taken. A functional analysis chart with this information was prepared by a research assistant and delivered to the therapist prior to the first IATP treatment session. A sample of such a chart appears in Figure 1.

An analysis of situations in which drinking occurred, and of the accompanying thoughts, feelings, and behaviors, was conducted to identify the circumstances that posed the most risk for each individual patient. In those cases in which the ES records did not yield a clear pattern of antecedents to drinking and drinking urges, the therapist asked the patient about possible antecedents to determine what patterns existed. Special attention was paid to situations in which drinking occurred repeatedly (at home, for example, as shown in Figure 1)..

IATP sessions focused on training four basic coping skills sets in each situation: Avoidance, Escape, Environmental Modification, and Personal Coping. Sessions 1 to 3 were devoted to analyzing the high-risk situations shown in the personalized functional analysis chart. Coping skills training initially addressed identification and avoidance of the patient's specific high-risk situations. For situations that could not be avoided, training included skills such as environmental modification (e.g., removing alcohol from the house), drink refusal and assertiveness specifically tailored for dealing with the identified high-risk situations, escape from high-risk situations, and “personal coping” (also known as emotion-focused coping, such as riding out an urge to drink, or relaxation). Homework was individualized, and built on information revealed in the FA Chart, as well as other situations recalled by the patient.

Sessions 4-6 focused on analysis of mood states that tended to predispose the patient to urges and to drinking. The FA Chart was used to explore the role of mood states as antecedents to urges and drinking. Focused skills training might entail mood monitoring, relaxation training, substituting positive thoughts, and other mood-related CB interventions as appropriate.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Sessions 7-9 involved patients' cognitions of self-efficacy, and expectations of the benefits drinking might provide in a situation. The FA Chart indicated when patients felt confident about their ability to stay abstinent and when they did not. Examples from the FA Chart, and experiences during treatment in which the patient did successfully manage high-risk drinking situations, were used to bolster the patient's self-efficacy in those situations, and to encourage generalization to similar situations. Homework entailed using cognitive strategies to boost self-efficacy between sessions (e.g., recording of successful coping efforts and discussing them in treatment).

Sessions 10-12 were concerned with applying the full range of coping skills developed in the prior sessions to the patient's daily life, bringing together skills for managing high-risk situations, mood states, and cognitions. In these final three sessions the therapist and the patient reviewed all the situations that the patient encountered during treatment, and drew upon the full range of coping opportunities to consider which tactics might have been employed in each of them. Homework entailed the monitoring of coping opportunities in the field, and practice of a variety of tactics. The use of problem solving, as well as the four key strategies of avoidance, escape, environmental change, and personal coping, was emphasized in these sessions.

Treatment integrity

Detailed outlines were provided for each PCBT treatment session, and more general outlines for IATP sessions. Therapists were required to follow the session outline and check off areas covered as sessions proceeded. Each treatment session was audio taped. The Clinical Coordinator listened to all session tapes for the therapist training cases and provided weekly supervision during training. Thereafter, the Clinical Coordinator listened to 33% of session tape recordings to confirm that session outlines were followed, and that elements of treatment were being delivered. Rates of adherence in both treatments were 89% and 93% respectively for the two therapists. After an initial training period, supervision of therapists was provided biweekly and covered both clinical issues and adherence to the treatment protocol.

Data Analysis

Dependent variables—The primary drinking outcome variables derived from the Form-90 were Proportion of Days Abstinent (PDA), Proportion Heavy Drinking Days (PDH) and Continuous Abstinence (0 or 1) for the 90 day period prior to follow-up (i.e., during treatment). A heavy drinking day was defined as one in which men consumed six or more drinks or women consumed four or more drinks. The PDA and PDH data were arcsine transformed to decrease the inherent skewness of proportion data (20). The DrInC Total score was the primary psychosocial dependent variable.

Outcome analyses—Changes in PDA, DrInC and CSS Total scores from pre- to posttreatment were analyzed using mixed model regression analyses (Proc MIXED; SAS Institute, 1999). These analyses employed maximum likelihood estimation to calculate parameter estimates, and thus allowed us to take advantage of all data collected. In these analyses Treatment condition was treated as a fixed effect, and Period (pre - post) and intercept as random effects. An unstructured covariance structure was adopted on the basis of accepted fit criteria (-2RLL, AIC) (21). Analysis of continuous abstinence at posttreatment was conducted using chi-square.

ES drinking and coping data—Only those records in which the patient indicated that drinking was permissible were included in analyses of coping actions. Two-step logistic regression analyses were conducted to evaluate the probability of a given coping response

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

being reported when tempted to drink. In the first step, the number of records provided, the time of the call nested within recording day, and day nested within recording period, were entered to evaluate the effects of timing on reports of coping. In the second step the terms for assessment Period (pre v. posttreatment), treatment condition, and the interaction of period × condition were entered. A significant interaction of period × condition indicated that that probability of a given type of coping had increased from pre- to posttreatment more in one of the treatments than in the other.

Momentary coping responses and outcomes—Random effects regression analyses with maximum likelihood estimation were used to evaluate the effects of change in coping responses on posttreatment outcomes. Dependent variables were PDA, PDH, Abstinence status, and DrInC values at posttreatment. The primary covariate was an aggregated coping change score computed by taking the average number of adaptive coping responses (i.e., all responses except “Drank” or “Nothing”) per temptation episode for each patient at posttreatment, covaried for the average value at pretreatment. The models included baseline values of the dependent variable and the momentary coping change score.

A logistic regression analysis was conducted to evaluate the influence of momentary coping responses on momentary drinking when tempted. Only those posttreatment records in which some temptation to drink was recorded, and in which it was permissible to drink, were included. With the momentary response of “Drank” (0 - 1) as the binary dependent variable, the model contained the following terms: pretreatment PDA, total records provided per subject, sequential record number during that day, day of recording, record × day of recording, treatment condition, adaptive coping score for that record, and the interaction of coping score × condition.

Results

Effects of Treatment on Outcome

Figure 2 shows the pre- and posttreatment means on the major outcome variables by treatment condition. Analysis of PDA showed no effect for treatment condition, a large main effect for Period [F (1, 90) = 183.49; $p < .001$], and a significant interaction effect of Condition × Period [F (1, 90) = 3.78; $p < .05$; effect size **d** = .40], such that PDA was higher for IATP patients at posttreatment (Figure 2, panel A). Analysis of PDH yielded a main effect for Time [F (1, 90) = 137.18; $p < .001$], but no main effect for Condition or for the interaction of Condition × Period (panel B). Analysis of proportion of patients reporting 90 days of abstinence at posttreatment showed a higher rate of abstinence in the IATP condition (30% v. 17%), but this was not significant [$\chi^2(1) = 1.28$] (panel C). The effect size of the difference between proportions, however, was moderate, h=.32. Analysis of the DrInC scores showed no effect for treatment condition, a main effect for Period [F (1, 90) = 95.35; $p < .001$], and a nonsignificant interaction effect of Condition × Period [F (1, 90) = 3.19; $p < .07$; effect size **d** = .31] (panel D).

Treatment Effects on Retrospective Coping

Both conditions resulted in increases in CSS scores from pre- to posttreatment (from approximately 1.3 to 1.8, SD=0.20). Results of the mixed model regression yielded no main effect for treatment Condition, a significant Period effect [F (1, 88) = 42.21; $p < .001$], and no significant effect for the interaction of Condition × Period.

Treatment Effects on Momentary Coping

Coping responses were recorded in response to “temptation episodes,” situations in which participants felt the urge to drink. Temptation episodes in both conditions averaged 1.60 (*SD*

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

= 0.45) per day at pretreatment, but dropped to 0.79 (*SD* = 0.35) per day for PCBT patients and 0.14 (*SD* = 0.28) per day for IATP patients at posttreatment. Mixed model regression was used to evaluate the number of temptation episodes per day. No main effect for Condition emerged, but a main effect was seen for Period [F (1, 74) = 32.23; $p < .001$], and for the interaction of Condition × Period [F (1, 74) = 7.10; $p < .01$], indicating that IATP patients reported significantly fewer temptation episodes at posttreatment than did the PCBT patients.

Results of logistic regression analyses on occurrence of coping responses to drinking temptations are summarized in Table 1. Condition was effect coded (-.5 = PCBT; .5 = IATP), and period was coded 1 (pretreatment) and 2 (posttreatment). A Bonferroni-Holm step-down procedure (22) was used to correct for the multiple tests. Shown in the table are results only from Step 2 of each of the analyses. (Step 1 results are not shown; for the most part there were no effects on any momentary coping response variables attributable to time of day, or day of the monitoring period).

As seen in the table, IATP patients were significantly less likely than PCBT patients to have reported drinking at posttreatment in response to temptation episodes. Numerous main effects for treatment condition emerged, mostly to the effect that the IATP condition was associated with greater probabilities of producing momentary coping responses overall than was the PCBT condition. The significant Condition × Period effect for “Drank” indicated that, at posttreatment, those in the PCBT condition were significantly more likely to take a drink in response to a drinking situation than were those in the IATP condition. Conversely, the other significant interaction effects shown in the table suggest that those in the IATP condition were significantly more likely than PCBT patients to respond to a drinking situation by avoiding situations, distracting oneself, refusing a drink, going elsewhere when tempted, or waiting out the urge to drink. As an illustration of the magnitude of the between treatment differences, Figure 3 shows the mean pre-post changes in proportions of coping responses reported in response to temptation, by treatment condition.

To get an overall estimate of coping change, an analysis of variance was conducted on the aggregated coping change scores by treatment condition. At pretreatment, participants in both treatment conditions reported using an average of 2.3 adaptive responses per temptation episode (*SD* = 2.2). At posttreatment IATP patients reported using 5.8 adaptive responses per temptation episode versus 4.2 responses for PCBT patients [*SD*=3.2; $F(1,76)=4.01$, $p < .05$; effect size **d**=.50].

Influence of Coping Responses on Drinking Outcomes

The analysis of Posttreatment PDA showed a significant effect for pretreatment PDA [F (1, 74) = 23.10; $p < .001$], and a significant effect for the coping response change score [F (1, 74) = 3.92; $p < .05$], such that increases in coping at posttreatment were associated with greater PDA. However, posttreatment PDH, DrInC scores, and continuous 90-days abstinence rates were not predicted by coping response change score.

Logistic regression analysis of momentary drinking at posttreatment yielded no effects for pretreatment PDA, record number (roughly equivalent to time of day), day of recording, or the interaction of record × day. The analysis did yield a significant effect for treatment condition (B= -1.4, *se* = 0.54; Wald $\chi^2 = 6.25$, $p < .01$; OR=0.79, 95%CI=0.43 to 0.95), a significant effect for coping score (B= -0.35, *se* = 0.06; Wald $\chi^2 = 37.73$, $p < .001$; OR=0.71, 95%CI=0. 63 to 0.79), and a non-significant interaction of treatment × coping score.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Coping as a Mediator of Treatment Effect

In order to determine if observed increases in adaptive coping in the IATP condition were accounting for the effects of treatment on PDA outcomes, a series of mixed model analyses was conducted in which: 1. posttreatment PDA was evaluated as a function of Treatment (with pretreatment PDA covaried); 2. posttreatment adaptive coping was evaluated as a function of Treatment (with pretreatment coping covaried); and 3. posttreatment PDA was evaluated as a function of adaptive coping (with both pretreatment coping and pretreatment PDA covaried). Regression estimates from these three equations were submitted to a product of coefficients analysis (23). The indirect effect of treatment condition on outcome, with coping as a mediator, was $\boldsymbol{\beta}' = 1.52$ ($se = 0.99$); $z = 1.56$; $p < .07$; 95% CI= -0.42 to 3.46.

Discussion

The IATP pilot study was intended to explore whether a treatment could be devised that would train adaptive coping skills to alcoholic patients more effectively than current manual-based coping skills treatments. It was hypothesized that IATP, with its highly idiographic approach to skills assessment and training, would yield more use of coping skills and better posttreatment outcomes than would a well-constructed, but less individualized, approach. To an important extent these hypotheses were borne out. PDA outcome was significantly (if modestly) better at posttreatment in IATP than in PCBT, although IATP yielded equivalent PDH and DrInC scores. IATP yielded nearly twice the abstinence rate as PCBT. If the follow-up had continued it is possible that the discrepancy between PCBT and IATP in abstinence might have increased over time, as has been demonstrated in other clinical trials (24).

The use of experience sampling allowed us to carefully assess not only drinking episodes, but also the coping responses employed (or not) in response to high risk situations. As hoped, IATP yielded significantly greater increases in the use of a variety of coping skills than did PCBT. Additionally, the increased coping was significantly associated with both posttreatment PDA, and with posttreatment drinking recorded on a momentary basis.

As indicated by the logistic regression analysis, participants who used an adaptive coping response when they were tempted were much less likely to drink at those moments. Indeed, each coping response reported resulted in a 30% reduction in the risk of drinking at that moment. Likewise, those who were in the IATP condition were less likely to drink. The interaction of treatment × coping was not significant in that analysis, but this was not surprising. We would not expect coping to be more effective just because a person is assigned to IATP. The function of IATP was to enhance coping, which in turn should reduce drinking.

One aspect of the coping response results is interesting. The IATP treatment appeared most successful at eliciting greater use of behavioral coping, or problem-focused strategies. Thus IATP patients responded with significantly greater increases in the use of avoidance, distraction and drink refusal than did the PCBT patients. The one cognitive or emotion-focused strategy that emerged for IATP was “waiting out the urge.” Both “waiting out the urge” and the use of behavioral coping were specifically covered in IATP as responses to the pretreatment ES assessments. Although these skills were also covered in the PCBT protocol, the nature of IATP, with its focus on addressing individualized strengths and deficits, allowed for greater time spent on tailoring the training of specific skills that would be most useful to the patient in his or her own environment.

The PCBT condition used here is an example of the kind of structured relapse prevention treatment used in many community and research settings. The highly individualized

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

structure of the IATP program made it much different from PCBT. It is not clear, therefore, whether differences in coping and outcome variables were a function of differences in therapy structure, content, or both.

There are some limitations to this study. Because of the pre-post design, the drinking recorded at posttreatment occurred during the treatment period. It is not known how these two treatments would have compared at more distant follow-up periods. Also, the failure to blind research assistants to treatment assignment must be considered a weakness, as is the fact that therapist adherence ratings were made by the therapy supervisor. Another issue is possible reactivity to the ES protocol; the idea that frequent prompts to answer questions about alcohol-related urges and behavior might have altered these urges and behavior. Reactive effects, if they occurred, do not threaten internal validity because all subjects participated in the same ES protocol. The greater threat is to the external validity of the study. However, there is evidence in the literature that experience sampling does not affect the relapse rate of treated alcoholics (25,26), or prevent substance use or other behaviors, such as overeating in dieters (27).

Another problem with any treatment based on analyzing high risk situations, is the difficulty many people have recognizing cravings or urges to drink. Our own research (15) has indicated that treated alcoholics are frequently unwilling to acknowledge, or unable to identify, cravings for alcohol. Therefore the results presented regarding temptation situations must be viewed with some caution. The IATP treatment in the present study, however, was based not only on drinking urges, but also recurring situations that were associated with drinking during the pretreatment period.

Because of limitations in the technology employed when the study started, open-ended coping questions were not used. Instead, subjects responded to a checklist that may have restricted or directed participants' recall of how they reacted to a potential high-risk situation. Two aspects of the data suggest that the restriction-of-choice problem may not have been severe. First, the data are distributed in a way that is consistent with how we believe patients respond in real life. For example, there was relatively resort to “pleasant thoughts.” Likewise, the rate of endorsing “refused a drink” was low; there are relatively few instances in most participants' days in which they are actually offered a drink. Second, participants did record their drinking episodes, and, more important, recorded when they did ”nothing” to avoid drinking. The present dataset, then, is at least valid on its face. Our upcoming work will allow free responses to characterize coping efforts.

A final limitation is that the IATP condition was only superior to PCBT in one of four outcomes. This is not a very serious limitation, however. The control condition used here was, intentionally, extremely strong. The intent of the present study was to determine if a treatment such as IATP could be implemented and if it would work as planned.

Despite the limitations of this study, we find the results to be quite encouraging. IATP did work as planned. IATP resulted in fewer temptation episodes at posttreatment than did PCBT, and when temptations were recorded IATP patients were less likely to drink and more likely to employ adaptive coping efforts to deal with them. Additional work will be undertaken to improve delivery of IATP and in-vivo assessment of coping.

Consistent with the hypotheses, IATP resulted in increased coping and reduced days of drinking at posttreatment. Additionally, a test of meditational effects of coping on PDA outcome approached significance. Nevertheless, the results of this study must be interpreted with caution. It is not clear whether reduced drinking at posttreatment reflected coping changes that occurred as a function of treatment (as hypothesized), or whether coping responses were enhanced due to changes in drinking. It will require another study with

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

additional follow-ups and interim coping assessments to establish a causal chain. It is possible, even likely, that coping and drinking influence each other over time, in a dynamic relationship. We are optimistic that the methodology employed here, for training coping skills and evaluating their effects on drinking, lead to a better understanding of the dynamics of coping and recovery.

Acknowledgments

Support for this project was provided by grants R21-AA014202 from the National Institute on Alcohol Abuse and Alcoholism, and in part by General Clinical Research Center grant M01-RR06192 from the National Institutes of Health. The authors would like to acknowledge Eileen Porter, William Blakey, Kara Dion, Abigail Sama, Aimee Markward, and Christine Calusine for their work in the conduct of this study.

References

1. Marlatt, GA.; Gordon, JR. Relapse prevention: Maintenance strategies in the treatment of addictive behaviors. Guilford; New York: 1985.
2. Longabaugh R, Morgenstern J. Cognitive-behavioral coping-skills therapy for alcohol dependence. Current status and future directions. Alcohol Research & Health: the Journal of the National Institute on Alcohol Abuse & Alcoholism. 1999; 23(2):78–85.
3. Morgenstern J, Longabaugh R. Cognitive-behavioral treatment for alcohol dependence: A review of evidence for its hypothesized mechanisms of action. Addiction. Oct; 2000 95(10):1475–90. [PubMed: 11070524]
4. Litt MD, Kadden RM, Cooney NL, Kabela E. Coping skills and treatment outcomes in cognitive-behavioral and interactional group therapy for alcoholism. J Consult Clin Psychol. Feb; 2003 71(1): 118–28. [PubMed: 12602432]
5. Project MATCH Research Group. Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH posttreatment drinking outcomes. J Stud Alcohol. 1997; 58(1):7–29. [PubMed: 8979210]
6. Carroll KM, Connors GJ, Cooney NL, DiClemente CC, Donovan DM, Kadden RR, et al. Internal validity of Project MATCH treatments: discriminability and integrity. J Consult Clin Psychol. 1998; 66(2):290–303. [PubMed: 9583332]
7. Kadden RM, Litt MD, Cooney NL, Kabela E, Getter H. Prospective matching of alcoholic clients to cognitive-behavioral or interactional group therapy. J Stud Alcohol. May; 2001 62(3):359–69. [PubMed: 11414346]
8. Coyne JC, Racioppo MW. Never the Twain shall meet? Closing the gap between coping research and clinical intervention research. Am Psychol. 2000; 55(6):655–64. [PubMed: 10892208]
9. Morgenstern J, Blanchard KA, Morgan TJ, Labouvie E, Hayaki J. Testing the effectiveness of cognitive-behavioral treatment for substance abuse in a community setting: within treatment and posttreatment findings. J Consult Clin Psychol. 2001; 69(6):1007–17. [PubMed: 11777104]
10. Kadden, RM.; Carroll, K.; Donovan, D.; N.L., C.; Monti, P.; Abrams, D., et al. NIAAA Project MATCH Monograph. U.S. Government Printing Office; Washington, D.C: 1992. Cognitive-Behavioral Coping Skills Therapy Manual: A Clinical research Guide for Therapists Treating Individuals with Alcohol Abuse and Dependence.
11. First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured Clinical Interview for DSM-IV Axis I Disorders - Patient Edition (SCID-I/P, Version 2.0). Biometrics Research Department, New York State Psychiatric Institute; New York: 1996.
12. Miller WR, Del Boca FK. Measurement of drinking behavior using the Form 90 family of instruments. Journal of Studies on Alcohol Supplement. 1994; 12:112–8. [PubMed: 7722987]
13. Tonigan JS, Miller WR, Brown JM. The reliability of Form 90: an instrument for assessing alcohol treatment outcome. J Stud Alcohol. 1997; 58(4):358–64. [PubMed: 9203116]
14. Miller, WR.; Tonigan, JS.; Longabaugh, R. NIAAA Monograph Rockville. U.S. Government Printing Office; MD: 1995. The Drinker Inventory of Consequences (DrInC).

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

15. Litt MD, Cooney NL, Morse P. Reactivity to alcohol-related stimuli in the laboratory and in the field: predictors of craving in treated alcoholics. Addiction. Jun; 2000 95(6):889–900. [PubMed: 10946438]

16. Litt MD, Cooney NL. Inducing craving for alcohol in the laboratory. Alcohol Res Health. 1999; 23(3):174–8. [PubMed: 10890812]

17. Larsen, RJ.; Diener, E. Promises and problems with the circumplex model of emotion. In: Clark, MS., editor. Emotion. Sage Publications; Newbury Park, CA: 1992.

18. Stout RL, Wirtz PW, Carbonari JP, Del Boca FK. Ensuring balanced distribution of prognostic factors in treatment outcome research. Journal of Studies on Alcohol - Supplement. 1994; 12:70–5. [PubMed: 7723001]

19. Monti, PM.; Kadden, RM.; Rohsenow, DJ.; Cooney, NL.; Abrams, DB. Treating Alcohol Dependence: A Coping Skills Training Guide. 2nd ed. Guilford Publications; New York: 2002.

20. Winer, BJ. Statistical Principles in Experimental Design. McGraw-Hill; New York: 1971.

21. Judge, GG.; Griffiths, WE.; Hill, RC.; Lutkepohl, H.; Lee, T-C. The theory and practice of econometrics. Wiley; New York: 1985.

22. Holm S. A simple sequentially rejective multiple test procedure. Scandinavian Journal of Statistics. 1979; 6:65–70.

23. MacKinnon DP, Lockwood CM, Hoffman JM, West SG, Sheets V. A comparison of methods to test mediation and other intervening variable effects. Psychological methods. Mar; 2002 7(1):83–104. [PubMed: 11928892]

24. Litt MD, Kadden RM, Kabela-Cormier E, Petry N. Changing network support for drinking: initial findings from the network support project. J Consult Clin Psychol. 2007; 75(4):542–55. [PubMed: 17663609]

25. Litt MD, Cooney NL, Morse P. Ecological momentary assessment (EMA) with treated alcoholics: methodological problems and potential solutions. Health Psychol. Jan; 1998 17(1):48–52. [PubMed: 9459069]

26. Filstead, WJ.; Parella, DP.; Ross, AM. The dynamics of relapse and recovery in alcoholics:Final report: Evaluation of the utility of the data base. National Institute of Alcohol Abuse and Alcoholism; Washington, DC: 1991.

27. Carels R, Hoffman J, Collins A, Raber A, Cacciapaglia H, O'Brien W. Ecological momentary assessment of temptation and lapse in dieting. Eating Behaviors. 2001; 2:307–21. [PubMed: 15001025]

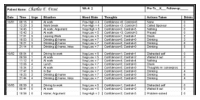

Figure 1.
Example of a portion of a Functional Assessment (FA) chart delivered to IATP therapists prior to a patient starting treatment, based on pretreatment experience sampling records. The mood state ratings were derived from the highest of the four mood composite scores. (Fictitious patient).

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

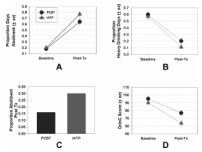

Figure 2.
Effects of treatment on drinking outcomes and on drinking consequences. Panel A, Percent Days Abstinent; Panel B, Percent heavy Drinking Days; Panel C, Proportion reporting continuous abstinence for previous 90 days; Panel D, DrInC scores.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

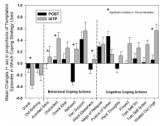

Figure 3.
Changes from pretreatment in proportions of coping responses employed in response to temptation episodes. Stars indicate those pre- to posttreatment coping changes by Condition that emerged as significant in logistic regression analyses of momentary data.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Addiction. Author manuscript; available in PMC 2010 November 1.

Table 1

Results of Logistic Regression Analyses on Probability of Endorsing a Coping Strategy When Tempted to Drink.[1]

Dependent Variable	Effect	Estimate	se	Wald Chi-Square	OR
Drank	Condition	-0.30	0.06	25.76†	0.74
	Period	-0.06	0.23	70.07	0.94
	Cond × Period	-0.10	0.06	6.61†	.90
Nothing	Condition	-0.24	0.06	18.28†	0.78
	Period	0.08	0.23	0.11	0.93
	Cond × Period	0.07	0.06	1.51	0.93
Avoid	Condition	0.12	0.06	4.07	1.13
Situations	Period	0.01	0.24	0.00	1.01
	Cond × Period	0.19	0.06	9.45†	1.20
Distracted	Condition	0.15	0.06	6.46†	1.16
Self	Period	0.35	0.24	2.22	1.42
	Cond × Period	0.21	0.06	12.31†	1.23
Drank	Condition	0.29	0.06	23.57†	1.34
Something	Period	0.14	0.24	0.34	1.15
Else	Cond × Period	0.13	0.06	4.51	1.14
Refused	Condition	0.51	0.08	38.01†	1.67
Drink	Period	-0.54	0.36	2.28	0.58
	Cond × Period	0.26	0.08	9.60†	1.30
Sought	Condition	0.25	0.08	10.53†	1.29
Social	Period	-0.11	0.32	0.12	0.90
Support	Cond × Period	-0.08	0.08	1.01	0.92
Went	Condition	0.24	0.08	8.74†	1.26
Elsewhere	Period	-0.23	0.35	0.41	0.80
	Cond × Period	0.23	0.08	8.08†	1.25
Thought of	Condition	0.05	0.06	0.78	1.05

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Dependent Variable	Effect	Estimate	se	Wald Chi-Square	OR
Negatives of	Period	0.30	0.23	1.73	1.36
Relapse	Cond × Period	0.07	0.06	1.65	1.08
Thought of	Condition	0.23	0.06	15.57†	1.26
Positives of	Period	0.17	0.23	0.55	1.19
Sobriety	Cond × Period	0.05	0.06	0.74	1.05
Thought	Condition	0.34	0.06	30.92†	1.41
Pleasant	Period	0.40	0.25	2.58	1.50
Thoughts	Cond × Period	0.07	0.06	1.28	1.07
Prayed	Condition	0.48	0.07	53.32†	1.61
	Period	0.14	0.26	0.30	1.16
	Cond × Period	0.12	0.07	3.40	1.130
Told Self Not	Condition	0.37	0.06	36.76†	1.44
To Drink	Period	0.22	0.24	0.84	1.24
	Cond × Period	0.08	0.06	1.68	1.08
Told Self to	Condition	0.51	0.06	65.62†	1.66
Stay Sober	Period	0.41	0.24	2.79	1.50
	Cond × Period	0.14	0.06	5.32	1.16
Waited Out	Condition	0.24	0.06	15.81†	1.27
Urge	Period	0.24	0.24	0.95	1.27
	Cond × Period	0.17	0.06	7.57†	1.18

Note:

OR= odds ratio.

†Wald Chi-square significant at Bonferroni-Holm step-down corrected alpha.

1Results corrected for Call number, Recording Day, Call Number within day, and Day within Period (per - posttreatment) entered on step one.